

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
1 September 2005 (01.09.2005)

PCT

(10) International Publication Number  
**WO 2005/081256 A1**

(51) International Patent Classification<sup>7</sup>: **G11C 11/04**

(21) International Application Number:  
PCT/SG2005/000022

(22) International Filing Date: 27 January 2005 (27.01.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
200400804-1 19 February 2004 (19.02.2004) SG

(71) Applicant (for all designated States except US): **AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH** [SG/SG]; 20 Biopolis Way, #07-01 Centros, Singapore 138668 (SG).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **CHONG, Tow Chong** [SG/SG]; 6 Jalan Rendang, Singapore 428344 (SG). **SHI, Lu Ping** [CN/SG]; Blk 141, Bukit Batok St. 11, #14-29, Singapore 650141 (SG). **ZHAO, Rong** [CN/SG]; Blk 343, Bukit Batok St. 34, #04-106, Singapore 650343 (SG). **MIAO, Xiang Shui** [CN/SG]; Blk 439, Choa Chu Kang Ave. 4, #08-435, Singapore 680439 (SG).

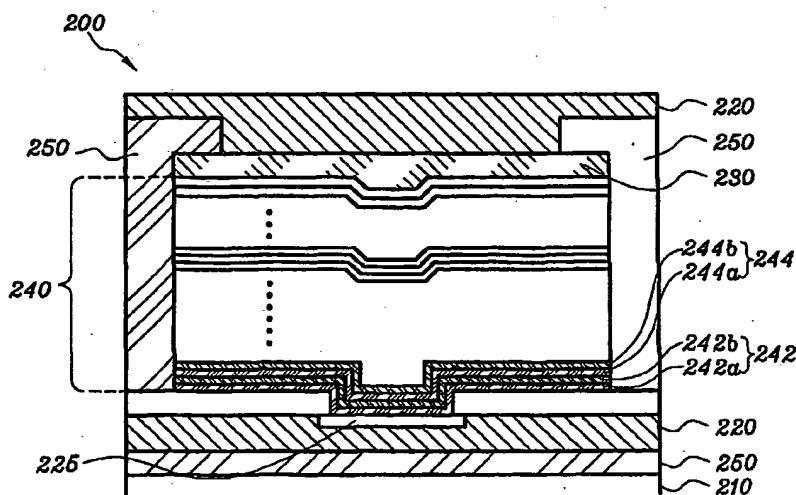
**TAN, Pik Kee** [MY/SG]; Blk 16A, West Coast Road, #01-03, Singapore 127303 (SG). **MENG, Hao** [CN/US]; ECE Department, 4-174D, 200 Union Street S.E., Minneapolis, Minnesota 55455 (US). **YI, Kai Jun** [CN/SG]; Blk 230, Choa Chu Kang Central, #05-161, Singapore 680230 (SG). **HU, Xiang** [CN/SG]; Blk 60, Telok Blangah Heights, #06-65, Singapore 100060 (SG). **LI, Ke Bin** [CN/SG]; Blk 290 D, Bukit Batok East Ave. 3, #13-366, Singapore 651290 (SG). **LUO, Ping** [CN/SG]; Blk 701, #13-30 Choa Chu Kang St. 53, Singapore 680701 (SG).

(74) Agent: **ALLEN & GLEDHILL**; One Marina Boulevard, Singapore 018989 (SG).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AF, AG, AI, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

[Continued on next page]

(54) Title: **ELECTRICALLY WRITEABLE AND ERASABLE MEMORY MEDIUM**



(57) Abstract: A memory cell for an electrically writeable and erasable memory medium as well as a memory medium thereof is provided. The memory cell comprises a data recording element, the data recording element has a plurality of multiple-layer structure disposed one on top of another, each the multiple-layer structure comprising a plurality of sequentially disposed individual layers. At least one of the plurality of individual layers is capable of changing phase between a crystalline state and an amorphous state in response to an electrical pulse, one of the plurality of individual layers having at least one atomic element which is absent from other one of the plurality of individual layers, and the plurality of multiple-layer structure is of a superlattice-like structure to lower a heat diffusion out of the data recording element to shorten a phase change time of the respective individual layers.

WO 2005/081256 A1



(84) **Designated States** (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GI, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

**Published:**

— with international search report